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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,525	08/21/2003	William Daniel Meisburger	56684-0305340	8919
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PILLSBURY WINTHROP SHAW PITTMAN LLP P.O. BOX 10500 MCLEAN, VA 22102			EXAMINER THOMAS, BRANDI N	
			ART UNIT 2873	PAPER NUMBER

DATE MAILED: 05/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/646,525

Applicant(s)

MEISBURGER, WILLIAM DANIEL

Examiner

Brandi N. Thomas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-35, 37-44, 63-68 and 80-95 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 63-68 is/are allowed.
- 6) ☒ Claim(s) 23-35, 37-39, 41, 43, 44, 80-88 and 90-95 is/are rejected.
- 7) ☒ Claim(s) 40, 42 and 89 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/28/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: Detailed Action.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/28/06 has been entered.

Information Disclosure Statement

2. Acknowledgement is made of receipt of Information Disclosure Statement(s) (PTO-1449) filed 2/28/06. An initialed copy is attached to this Office Action.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 23-35, 37-39, 41, 43, 44, and 80-82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain et al. (6312134) in view of Takahashi (US 2002/0080339 A1).

Regarding claim 23, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate, comprising: a spatial light modulator (3), said spatial light modulator (3) comprising at least one area array of individually switchable elements (array of micromirrors, individual mirrors tilt in different directions (Col. 7, lines 12-16); a light source (1) configured to illuminate said spatial light modulator (3) (col. 7, lines 11-12); and an image movement mechanism for

moving said image across the surface of said substrate (5) (col. 7, lines 30-34 and 66) but does not specifically disclose the imaging optics configured to project a blurred image of said spatial light modulator on said substrate. Takahashi discloses wherein the imaging optics (PL) configured to project a blurred image of said spatial light modulator (3) on said substrate (W) (sections 0009 and 0116). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Jain et al. with the blurred image of Takahashi for the purpose of decreasing image resolution (sections 0009 and 0116).

Regarding claim 24, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate, wherein said spatial light modulator (3) comprises at least one digital micro-mirror device (col. 7, line 13).

Regarding claim 25, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate, wherein said light source (1) is a continuous light source (col. 8, lines 18-21).

Regarding claim 26, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate, wherein said light source (1) is an arc lamp (col. 2, line 35 and col. 8, lines 23-25).

Regarding claim 27, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate, wherein said light source (1) is a laser (col. 7, line 46).

Regarding claim 28, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate, wherein said laser is a continuous laser (col. 8, lines 18-21).

Regarding claim 29, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate, wherein said laser is a continuous laser (col. 8, lines 18-21) but does not specifically disclose the laser as a quasi-continuous laser. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention and use a quasi-

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continuous laser for the purpose of a quasi-continuous laser has a pump source that is switched on for short time intervals.

Regarding claim 30, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate, wherein said imaging optics (4) is a projection lens system (col. 7, lines 16-18) but does not specifically disclose wherein the imaging optics is a telecentric projection system. Takahashi discloses wherein the imaging optics is a telecentric projection system (section 0072). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Jain et al. with the telecentric projection system of Takahashi for the purpose of the light remaining perfectly perpendicular to the plane (section 0072).

Regarding claim 31, Jain et al. discloses the claimed invention but does not specifically disclose wherein said imaging optics is configured to form a defocused image of said spatial light modulator. Takahashi discloses wherein the imaging optics (PL) is configured to form a defocused image of said spatial light modulator (sections 0009 and 0116). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Jain et al. with the blurred image of Takahashi for the purpose of decreasing image resolution (sections 0009 and 0116).

Regarding claim 32, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate but does not specifically disclose wherein said imaging optics that blurs said image of said spatial light modulator or the use of a diffuser. Takahashi discloses wherein the imaging optics (PL) configured to project a blurred image of said spatial light modulator (3) on said substrate (W) (sections 0009 and 0116). Therefore it would have been obvious to one having

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ordinary skill in the art at the time the invention was made to combine the device of Jain et al. with the blurred image of Takahashi for the purpose of decreasing image resolution (sections 0009 and 0116). However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a diffuser for the purpose of a diffuser scatters or disperses light emitted from a source.

Regarding claim 33, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate but does not specifically disclose wherein said imaging optics has a numerical aperture adjusted such that said image of said spatial light modulator is blurred. Takahashi discloses wherein said imaging optics (PL) has a numerical aperture adjusted such that said image of said spatial light modulator is blurred (sections 0009, 0056, 0057, and 0116). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Jain et al. with the blurred image of Takahashi for the purpose of decreasing image resolution (sections 0009, 0056, 0057, and 0116).

Regarding claim 34, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate but does not specifically disclose wherein said imaging optics comprises a microlens array configured to blur said image of said spatial light modulator. Takahashi discloses wherein said imaging optics (PL) comprises a microlens array configured to blur said image of said spatial light modulator (sections 0059, 0072, and 0085). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Jain et al. with the microlens of Takahashi for the purpose of having an illumination system (sections 0059, 0072, and 0085).

Regarding claim 35, Jain et al. discloses, in figure 4, a lithographic tool for patterning a substrate, wherein said imaging optics (4) comprises a single projection lens system (col. 7, lines 16-20).

Regarding claim 37, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate, wherein said image movement mechanism comprises a stage (6) on which said substrate (5) is carried (col. 7, line 18).

Regarding claim 38, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate, wherein said image movement mechanism comprises a stage (6) (col. 7, lines 13-18) but does not specifically disclose a stage on which said spatial light modulator is carried. Takahashi discloses, in figure 1, a stage (7) on which said spatial light modulator is carried (section 0052). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Jain et al. with the stage of Takahashi for the purpose of moving the spatial light modulator in a particular direction (section 0052).

Regarding claim 39, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate but does not specifically disclose a stage on which said imaging optics is carried. Takahashi discloses, in figure 1, a stage (7) on which said imaging optics (PL) is carried (section 0052). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Jain et al. with the stage of Takahashi for the purpose of moving the imaging optics in a particular direction (section 0052).

Regarding claim 41, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate, further comprising a control computer (7) configured to control switching said

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elements of said spatial light modulator while said image is moving across the surface of said substrate (5) (col. 7, lines 24-30).

Regarding claims 43, 44 and 82, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate, comprising: a spatial light modulator (3), said spatial light modulator (3) comprising a multiplicity of area arrays of individually switchable elements (array of micromirrors, individual mirrors tilt in different directions (Col. 7, lines 12-16); a light source (1) configured to illuminate said spatial light modulator (3) (col. 7, lines 11-12); and an image movement mechanism for moving said image across the surface of said substrate (5); wherein the number of said area arrays is greater than the number of said projection lens systems (col. 7, lines 16-18) but does not specifically disclose a plurality of spatial light modulators and a multiplicity of projection lens systems configured to project a blurred image of said spatial light modulator on said substrate. It would have been obvious to modify the invention to include a plurality of spatial light modulator, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art (St. Regis Paper Co. v. Bemis Co., 193 USPQ 8). Takahashi discloses wherein the imaging optics (PL) configured to project a blurred image of said spatial light modulator (3) on said substrate (W) (sections 0009 and 0116). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Jain et al. with the blurred image of Takahashi for the purpose of decreasing image resolution (sections 0009 and 0116).

Regarding claim 80, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate, wherein said spatial light modulator (3) is a diffractive device (col. 5, lines 8-10).

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Regarding claim 81, Jain et al. discloses, in figure 1, a lithographic tool for patterning a substrate, wherein said spatial light modulator (3) is a liquid crystal device (col. 10, lines 10-19).

5. Claims 83-88 and 90-95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain et al. (6312134) in view of Takahashi (US 2002/0080339 A1) as applied to claim 82 above, and further in view of Eggers et al. (6965364).

Regarding claims 83, 85, and 86, Jain et al. and Takahashi disclose a lithographic tool for patterning a substrate but does not specifically disclose wherein said plurality of spatial light modulators are arranged in at least one row, said at least one row being perpendicular to the direction of movement of said image across the surface of said substrate. Eggers et al. discloses wherein said plurality of spatial light modulators are arranged in at least one row, said at least one row being perpendicular to the direction of movement of said image across the surface of said substrate (col. 1, lines 9-21 and 24-35). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the devices of Jain et al. and Takahashi with the spatial light modulators of Eggers et al. for the purpose of keeping stationary relative to the photosensitive material during the motion (col. 1, lines 9-21 and 24-35).

Regarding claims 84 and 87, Jain et al. and Takahashi disclose a lithographic tool for patterning a substrate but does not specifically disclose wherein said spatial light modulators are equally spaced within said row. Eggers et al. discloses wherein said spatial light modulators are equally spaced within said row (col. 1, lines 9-21 and 24-35). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the devices of Jain et al. and Takahashi with the spatial light modulators of Eggers et al. for the

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purpose of keeping stationary relative to the photosensitive material during the motion (col. 1, lines 9-21 and 24-35).

Regarding claim 88, Jain et al. and Takahashi disclose a lithographic tool for patterning a substrate but does not specifically disclose wherein the positions of said spatial light modulators are staggered from one row to the next. Eggers et al. discloses, in figure 3, the positions of said spatial light modulators are staggered from one row to the next (col. 1, lines 9-21 and 24-35). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the devices of Jain et al. and Takahashi with the spatial light modulators of Eggers et al. for the purpose of keeping stationary relative to the photosensitive material during the motion (col. 1, lines 9-21 and 24-35).

Regarding claim 90, Jain et al. and Takahashi disclose a lithographic tool for patterning a substrate but does not specifically disclose wherein the plurality of spatial light modulators are configured in a two-dimensional array. Eggers et al. discloses wherein the plurality of spatial light modulators is configured in a two-dimensional array (col. 1, lines 9-21 and 24-35). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the devices of Jain et al. and Takahashi with the spatial light modulators of Eggers et al. for the purpose of keeping stationary relative to the photosensitive material during the motion (col. 1, lines 9-21 and 24-35).

Regarding claim 91, Jain et al. and Takahashi disclose a lithographic tool for patterning a substrate but does not specifically disclose wherein the plurality of spatial light modulators are configured to make most efficient use of said imaging optics. Eggers et al. discloses wherein the plurality of spatial light modulators is configured to make most efficient use of said imaging

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optics (col. 1, lines 9-21 and 24-35). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the devices of Jain et al. and Takahashi with the spatial light modulators of Eggers et al. for the purpose of keeping stationary relative to the photosensitive material during the motion (col. 1, lines 9-21 and 24-35).

Regarding claim 92, Jain et al. and Takahashi disclose a lithographic tool for patterning a substrate but does not specifically disclose wherein the plurality of spatial light modulators are arranged within a roughly circular area. Eggers et al. discloses wherein the plurality of spatial light modulators is arranged within a roughly circular area. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the devices of Jain et al. and Takahashi with the spatial light modulators of Eggers et al. for the purpose of keeping stationary relative to the photosensitive material during the motion (col. 1, lines 9-21 and 24-35).

Regarding claim 93, Takahashi discloses a lithographic tool for patterning a substrate, wherein said light source comprises a lens array configured to maximize the light intensity on each spatial light modulator (sections 0059, 0072, and 0085) but does not specifically disclose a plurality of spatial light modulators. It would have been obvious to modify the invention to include a plurality of spatial light modulator, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art (St. Regis Paper Co. v. Bemis Co., 193 USPQ 8). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention to include a plurality of spatial light modulator for the purpose of modulating large quantity of light.

Regarding claim 94, Takahashi discloses a lithographic tool for patterning a substrate, wherein said imaging optics comprises on projection lens system (PL) projection lens for a spatial light modulator (sections 0059, 0072, and 0085) but does not specifically disclose a plurality of spatial light modulators. It would have been obvious to modify the invention to include a plurality of spatial light modulator, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art (St. Regis Paper Co. v. Bemis Co., 193 USPQ 8). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention to include a plurality of spatial light modulator for the purpose of modulating large quantity of light.

Regarding claim 95, Takahashi discloses a lithographic tool for patterning a substrate, wherein the imaging optics is a telecentric projection system (section 0072) but does not specifically disclose a plurality of spatial light modulators. It would have been obvious to modify the invention to include a plurality of spatial light modulator, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art (St. Regis Paper Co. v. Bemis Co., 193 USPQ 8). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention to include a plurality of spatial light modulator for the purpose of modulating large quantity of light.

Allowable Subject Matter

6. Claims 63-68 are allowed.

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7. Claims 40, 42, and 89 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the independent claim(s), in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in claim(s) 40, 42, 63, 67, and 89, wherein the claimed invention comprises, in claim 40, wherein said image movement mechanism comprises rotatable, spaced apart, axially parallel film drums, said substrate being wrapped around and tensioned between said drums; in claim 42, wherein the substrate comprises a height measuring system; in claim 63, a light switching mechanism positioned on a light path, said light path going from said light source to said spatial light modulator and ending at said substrate, said light switching mechanism being configured to control passage of light along said light path; in claim 67, and a second spatial light modulator positioned on a light path, said light path going from said light source to said first spatial light modulator and ending at said substrate, said second spatial light modulator being configured to control passage of light along said light path; in claim 89, wherein the spatial light modulators are configured such that each spatial light modulator exposes a non-overlapping swath of the substrate, as claimed

Response to Arguments

8. Applicant's arguments with respect to claims 23-25, 37-44, 63-68, and 80-95 have been considered but are moot in view of the new ground(s) of rejection.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandi N. Thomas whose telephone number is 571-272-2341.

The examiner can normally be reached on 7- 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on 571-272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


BNT
May 3, 2006


RICKY MACK
SUPERVISORY PATENT EXAMINER